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NOTES ON AN ELEMENTARY COURSE IN HOUSE PLANNING

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Professor of Manual Arts, State Normal College, Kent, Ohio.

SOON after entering his present position the author found a need for a course in house planning that would require but little time from the student and would enable those taking it to understand simple house plans.

After three years of evolution the work of the course has been quite definitely organized and the notes given below are now used with good effect to assist in making the most of the limited time available. They are given here in the belief that others will find the notes helpful in meeting a similar need. The course is preceded by a forty-five hour course in mechanical drawing in which the use of the tee-square, triangles, pencil and ruling pen get a fair share of attention, and on each day ten minutes is devoted to lettering.

The course in house planning is also a forty-five hour course, but more time should be allowed for it, as in this length of time, with beginning students the work can only be done in pencil, and not all of the students will complete Problem 4. Very little originality is expected with the first problem, but opportunity for ori-

A THREE-ROOM COTTAGE.

PROBLEM I. To make a plan and two elevations of a three-room rectangular cottage 15'x22'.

A. *Make a freehand sketch of plan* on half-inch squared paper to a scale of $\frac{1}{2}''=1'$. Walls are to be 6'' thick and represented as in Fig. 1. Outside doors are to be 2' 3'' wide; inside doors are to

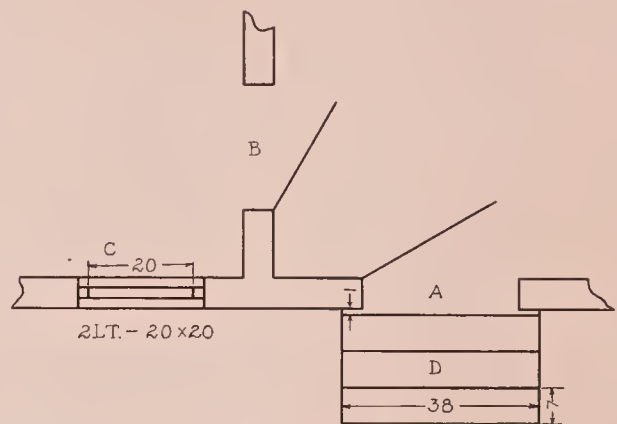


FIG. 1.

be 2' wide; and they are to be represented as at A and B in Fig. 1. Windows are to be 1' 10'' wide and are to be represented as at C in Fig. 1. Show three steps at outside doors as at D in Fig. 1.

Letter the name of each room, and also

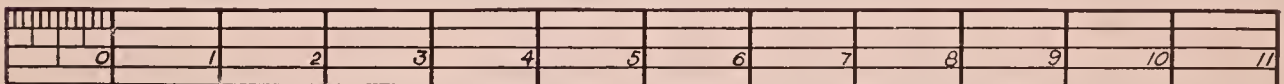


FIG. 2.

ginality increases as the course advances. By limiting this originality on the part of the weaker students, they may cover the course and get the fundamentals of it. S

letter below the drawing "Plan of Cottage." Consider the front of the cottage as the bottom of the drawing when doing this lettering.

B. *Make a paper scale of $\frac{1}{2}''=1'$ as in Fig. 2. Consult instructor for method of dividing first half-inch into twelfths.*

C. *Make a mechanical drawing of the plan from the sketch made in A using the scale made in B. The size of paper to be used is 12"x19".*

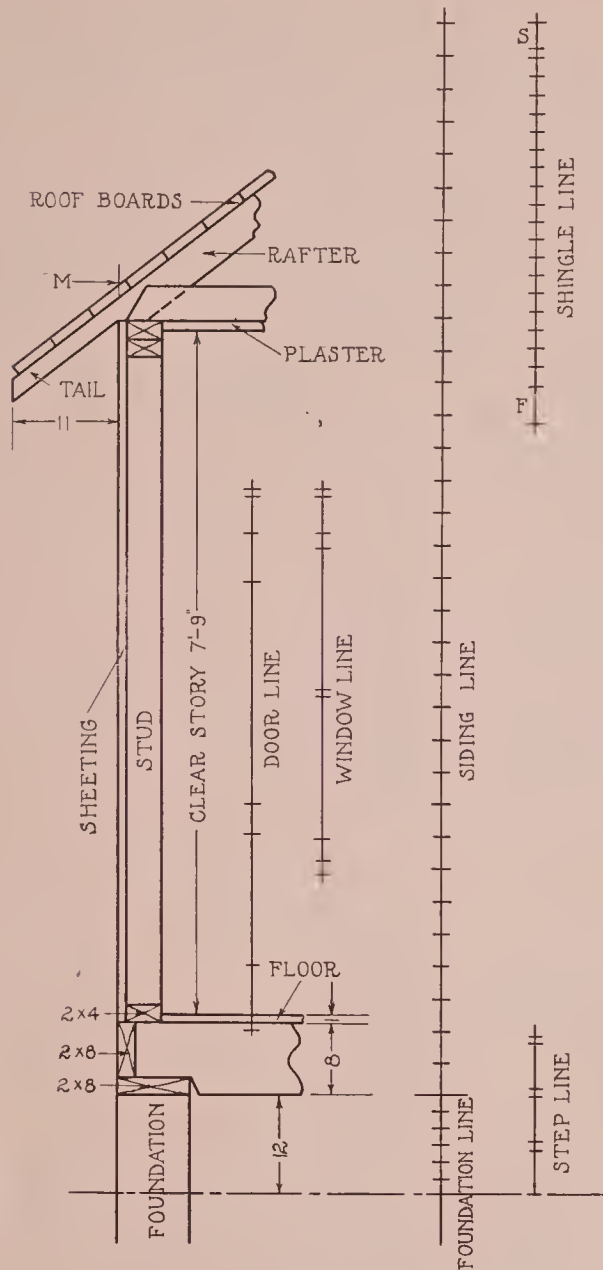


FIG. 3.

Make the entire drawing with light lines, all lines extending a little farther than they will be needed. Lines representing doors should make an angle of 30° with the wall on which they swing.

Intensify, with the conical point of the hard pencil, all horizontal lines, then vertical lines, and last, the slanting lines.

Clean off all lines not intensified, and letter.

D. *Make a mechanical drawing showing details of part of a house frame.*

Tack a sheet of paper with its left end about $\frac{1}{4}''$ from the left end of the board.

Draw, as in Fig. 3, a horizontal ground line about $\frac{3}{4}''$ from the bottom of the sheet and a vertical line for the outside of the wall about 2" from the left end of the paper. Draw details of foundation, floor, side wall and ceiling, using the scale made in B.

Above the detail of house frame just drawn, draw the diagram in Fig. 4, showing the pitch of the roof. Use $\frac{3}{8}$ as the pitch in drawing the diagram, and make C D 8" long.

Draw the lower line of the tail of the rafter, Fig. 3, parallel to the left line of the pitch diagram, Fig. 4. Draw the upper line of the rafter parallel to this line and 2" from it, Fig. 3. Represent the

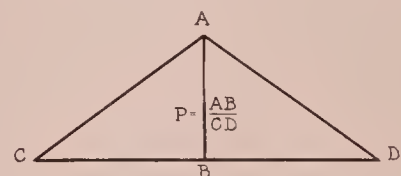


FIG. 4.

lower edge of the rafter by a line parallel to and 4" from the line just drawn. The line representing the upper surface of the roof boards should be parallel to and 1" from the upper line of the rafter. The vertical line for the end of the tail of the rafter should be 11" outside of the wall, Fig. 3.

The vertical lines showing the spacing for the foundation, siding, doors, windows, steps and shingles are to be drawn later when drawing the elevations.

E. *Make a mechanical drawing of the narrower elevation of the cottage on the same sheet of paper as used for D.*

Slip the end of the paper used for C

under the upper edge of the paper used for D so that the wall of the plan will be close to the upper edge of the paper, and tack thru both sheets.

Using the triangle on the tee-square, draw lightly, vertical lines even with the corners of the house and even with the sides of the doors and windows that will show on this elevation. The sheet with the plan on may now be removed.

Use tee-square, and draw on a level with the point M, two short lines crossing

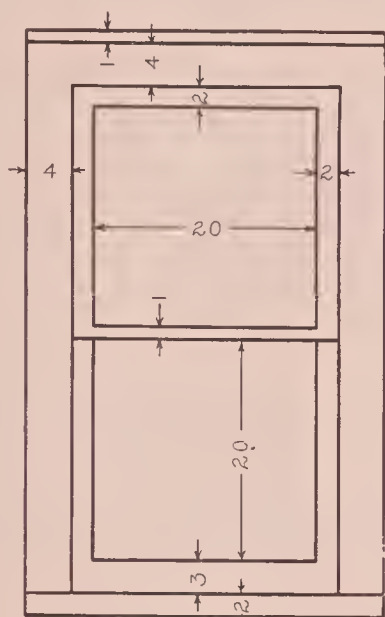


FIG. 5.

the two vertical corner lines of the cottage. Thru the two points located by the intersection of these horizontal and vertical lines draw lines parallel to the two slanting lines of the pitch diagram for the roof lines. Also draw lines parallel to these 4" inside of them for the edges of the fascia boards; also draw two others parallel to and 6" inside of those just drawn for the lower edges of the frieze boards. Draw four short vertical lines; two of them 11" and two of them 12" outside of the corner lines of the house and at such a height that when the two upper slanting lines are extended they will intersect them. Draw the vertical lines for the inner edges of the corner boards

parallel to and 4" inside of the lines for the corners of the house.

Draw the vertical door line as shown in Fig. 3, showing the heights of all horizontal lines for the doors and also the vertical window line showing the heights of all horizontal lines for the windows. The heights to be located on these lines may be determined from Figs. 5 and 6. The bottom of the door is to be even with

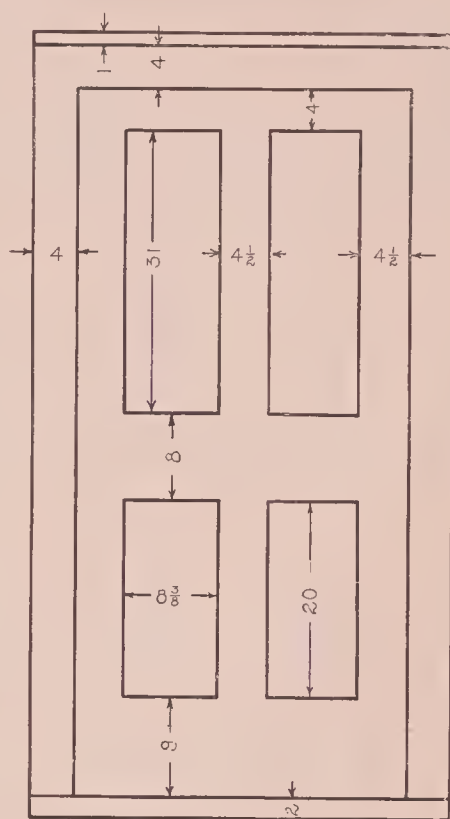


FIG. 6.

the top of the floor, and the upper casings and drip caps of the doors and windows are to be on the same level. Draw lightly all horizontal lines for the doors and windows to be shown in this elevation. Also draw the additional vertical lines for the doors and windows.

Draw, as in Fig. 3, the vertical step line. The top of the upper step should be even with the bottom of the door sill. The space from the top of the upper step to the ground line should be divided into three equal parts. (Consult the instructor for the method to be used in doing this.) These divisions give the tops of the other

steps. Represent the treads of the steps as 1" thick. Draw lightly the outline of steps as in Fig. 7 or Fig. 8.

Draw, as in Fig. 3, the vertical foundation and siding line. Measure off on it 2" spaces for the foundation and 4" spaces for the siding.

From the upper end of the left slanting roof line, measure down 5" for the width

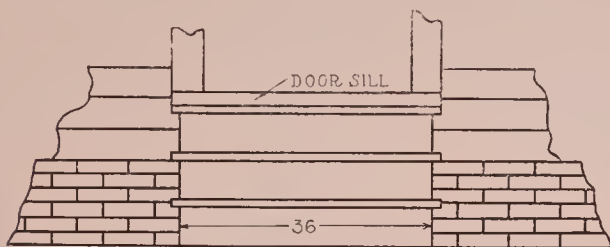


FIG. 7.

of the saddle board, and beginning at the point where the outer short vertical line intersects the same slanting roof line, measure up on it 6" spaces for the shingles. Now draw the vertical shingle line, and using the tee-square draw short lines intersecting this vertical line level with the top of the roof and with each point located on the slanting roof line. Also draw a short line level with the lowest point of the fascia board, which is where the line for the inner edge of the fascia board intersects the inner short vertical line. A letter S should be made by the space on the vertical shingle line that is level with the saddle board and a letter F by the space that is level with the fascia board.

Intensify all horizontal lines for windows, doors and steps. Intensify all vertical lines for windows, doors and steps. Intensify, as you draw it in, the line between the foundation and the siding. Intensify the roof lines to the outer short vertical lines, the fascia lines to the inner short vertical lines, the frieze line to the corner of the house and the inner short vertical line between the roof line and the fascia line. Intensify the corner line of the house from the line between the foundation and

siding to the fascia line, and the line for the inner edge of the corner board from the same line to the frieze line. Also intensify as you draw two vertical lines between the ground line and the line at the top of the foundation; each line to be 1" inside of the corner line of the house. Starting at the top, intensify as you draw the horizontal siding and foundation lines. Draw a light horizontal line $\frac{1}{4}$ " below the ground line. Beginning at a point 1" inside of each corner of the house measure off on this line 4" spaces until even with the nearer side of the steps or if no steps cover part of the foundation, to the middle of the house. Intensify as you draw the short vertical lines for the bricks as in Fig. 8. Behind the steps, or near the middle of the house, there will be some bricks less than 8" long.

Clean off all parts of lines not intensified and letter title of sheet "Front Ele-

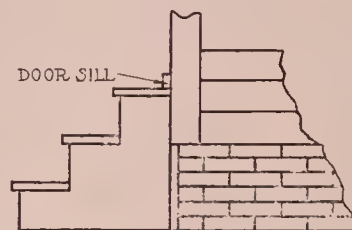


FIG. 8.

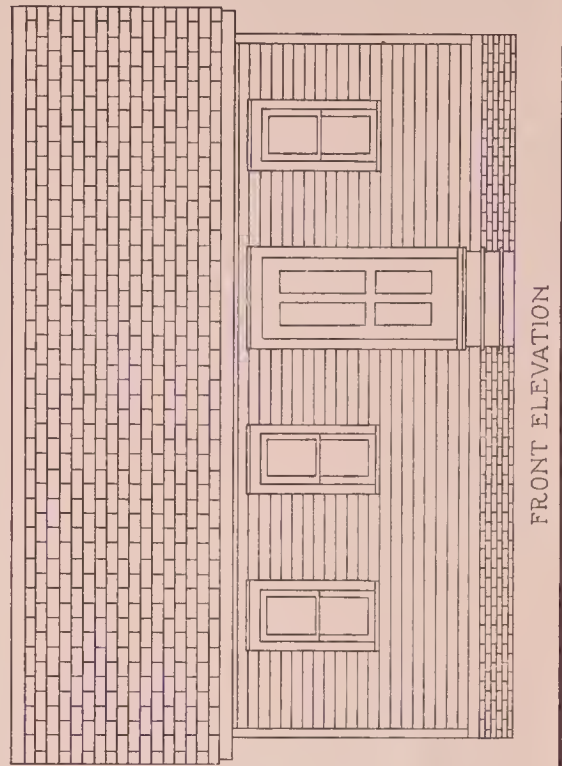
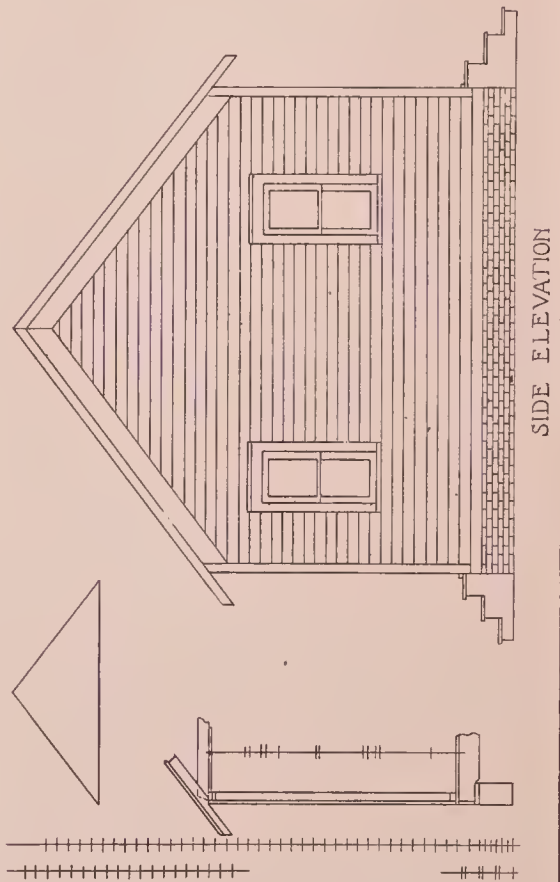
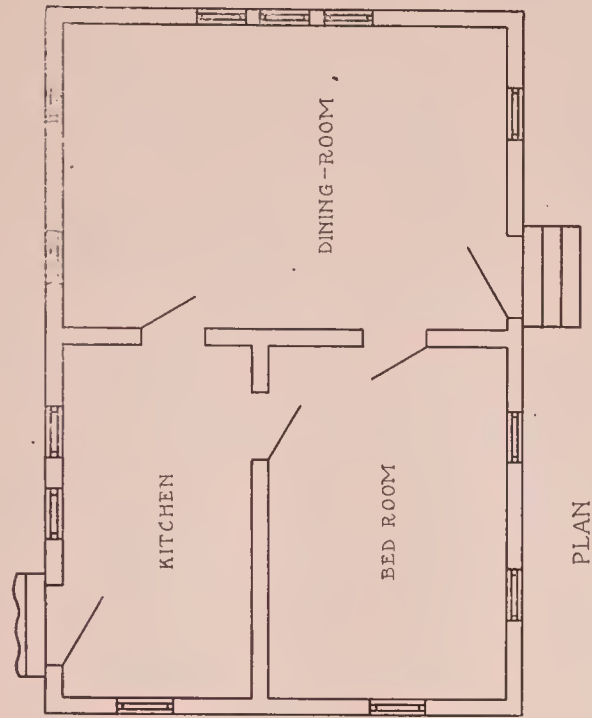
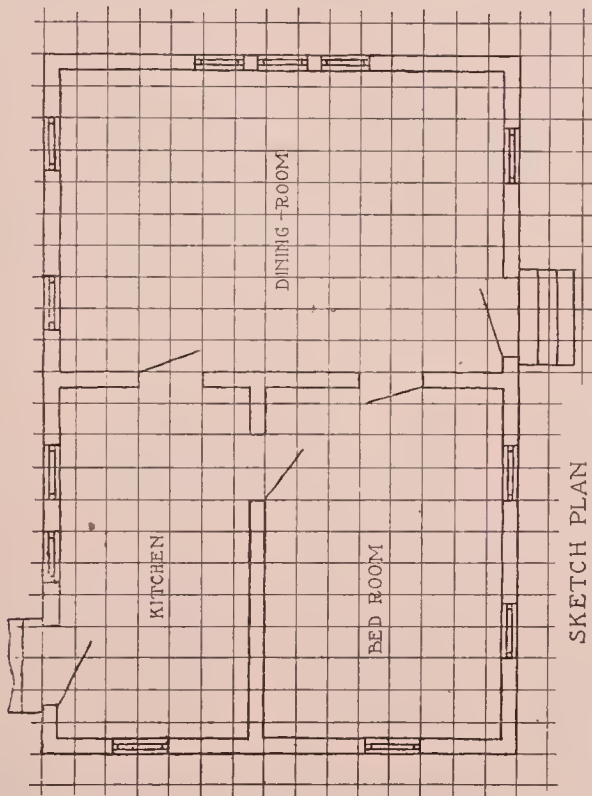
vation of Cottage" or "Side Elevation of Cottage."

F. *Make a mechanical drawing of the wider elevation of cottage.*

Do not remove the paper you have been using from the board, but tack another sheet over it. This should be farther to the right so as to just expose the vertical lines at the left of the elevation. Slip the long edge of the paper used for C under the upper edge of the paper just tacked on so that the wall of the plan will be close to the upper edge of the paper, and tack thru the three sheets.

Using a triangle on the tee-square, draw lightly the vertical lines even with the

STEPS IN PROBLEM I



corners of the house and even with the sides of the doors and windows that will show on this elevation. The sheet with the plan on may now be removed. Draw the horizontal lines for the doors and windows, using the vertical door and window lines that are exposed at the left end of the sheet. Also draw in lightly the steps as you did on the other elevation, using the same vertical step line. Draw

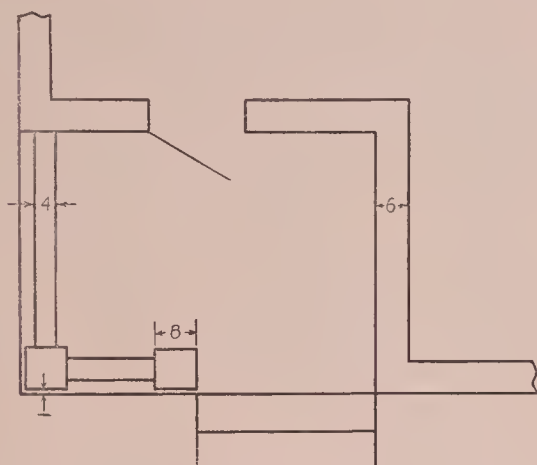


FIG. 9.

lightly a long vertical line 12" outside of each corner line. Draw two light horizontal lines crossing these lines, the upper one being level with the highest mark on the vertical shingle line and the lower one level with the lowest mark on the shingle line. The first line represents the top of the roof and the last line is to represent the lower edge of the facia board. Intensify as you draw the horizontal line between the foundation and the siding, and the vertical lines for the inner edges of the corner boards between the horizontal lines just drawn and the lower edge of the facia board. Intensify all lines for the windows, doors and steps. Intensify as you draw the vertical lines 1" inside of the corners of the house between the ground line and the line above the foundation, also the outer long vertical lines between the upper line of the roof and the upper line of the facia board. Draw a light line $\frac{1}{4}$ " below the ground line, and

measure off 4' spaces on it for the foundation as when drawing the other elevation. Also draw a light horizontal line $\frac{1}{4}$ " above the upper horizontal roof line and measure off in a similar manner 5" spaces on it for the shingles. Intensify as you draw the horizontal lines for the shingles, siding and foundation, also the short vertical lines to represent the sides of the shingles and the ends of the bricks. Remember that the space level with S on the vertical shingle line is to be left clear to represent the saddle board and that the space level with F on the vertical shingle line is to be left clear to represent the facia board. Short vertical lines should be intensified as drawn for the ends of the facia board. These lines should be 11" outside of the corners of the house. Intensify the lower edge of the facia board.

Clean off all parts of lines not intensified and letter title of sheet "Front Elevation of Cottage" or "Side Elevation of Cottage."

AN L-SHAPED COTTAGE.

PROBLEM II. To make a plan and two elevations of an L shaped cottage 20'x27'. Neither part of the L should be wider than 17', and there should be a difference

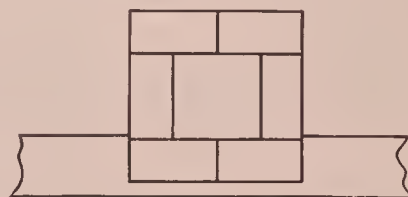


FIG. 10.

of at least 1' in the widths of the two parts of the L.

A. *Make freehand sketches of two plans* on half-inch squared paper; one having the 27' dimension parallel to the street and the other having it at right angles to the street. A porch should be represented as in Fig. 9 in the angle of the L. A chimney having an 8" flue should be lo-

cated in an interior partition, and it should be represented as in Fig. 10. The size of the doors and windows may be varied for this cottage if desired. (Consult the instructor for the stock sizes of these.)

B. When the instructor has approved both of these sketched plans *select the one that suits you best and make a mechanical drawing of it*, using the half-inch scale.

C. *Make a vertical detail of the house frame* as explained in D, Problem 1. Use the same data except for the pitch of the roof which should be $9/16$, and the clear story should be 8'. Remember to locate the point M on this detail. Also draw the vertical door line, window line, step line and foundation and siding line.

D. On the same sheet as used for C, *draw that part of the elevation that will show the narrower gable*.

The general plan of the roof is to be similar to that shown in Fig. 11. The long line extending thru the middle of one part of the L represents the higher ridge on the roof with the two wider gables at the ends of it. The shorter line thru the middle of the other part of the L, at right angles to the long ridge line but not touching it, represents a lower ridge with the narrower gable at its outer end. The two



FIG. 11.

slanting lines represent valleys in the roof.

Slip the plan made in B under the paper used for C so that the short ridge line will be at right angles to, and the narrow gable will be just above the upper edge of the paper, and tack it in this position. Draw lightly the vertical lines for the three visible corners of the house, for the windows,

doors and for the chimney. Locate the two points level with the point M on the two vertical lines that represent the end with the narrower gable. Draw the two slanting roof lines, the fascia lines, the frieze lines and the four short vertical lines, two of them 11" and two of them 12" outside of the corner lines of the house. Draw lightly the horizontal line for the top of the foundation, the vertical lines for the two corner boards, the horizontal lines for the doors and windows and a vertical shingle line for this gable.

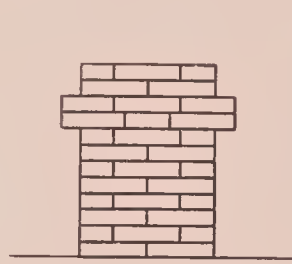


FIG. 12.

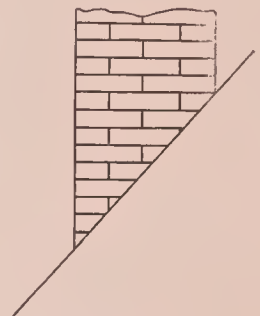


FIG. 13.

In making this shingle line do not forget to make a mark level with the lowest point of the fascia board.

E. *Draw part of the elevation that will show the wider gable*. Another sheet of paper should now be tacked over the partly completed elevation with the detail of the frame and the vertical height lines exposed at the left. Also slip under the upper edge of this sheet the plan made in B, with the outer angle of the L at the top and with the line representing the wider gable close to the upper edge of the paper. Draw lightly the vertical lines for the three corners, the windows, doors, and chimney. Locate the two points level with the point M for the wider gable. Draw the slanting roof lines, fascia lines, frieze lines and the four short vertical lines, two of them 11" and two of them 12" outside of the corner lines of the house. Draw lightly the horizontal lines for the top of the foundation, and for the doors and

windows. On the sheet with the other details, draw the vertical lines for the two corner boards and a separate vertical shingle line for this gable. Draw a hori-

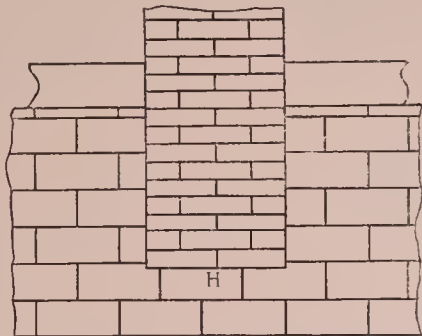


FIG. 14.

zontal line even with the highest point on the shingle line. This represents the top

other vertical height lines, with its highest mark 18" above the highest point of the wider gable, and lay off 2" spaces from that end down. Draw the horizontal lines for the chimney as in Fig. 12, if the chimney is behind the lower ridge. If the chimney passes thru the large sloping roof and no part of it is behind the lower ridge the bottom of it will be shown as in Fig. 13. If the chimney passes thru the smaller roof, in front of the ridge, the bottom of it will be shown as in Fig. 14. The height of the line H, Fig. 14, should be determined from the other elevation. If this elevation is the one that is 27' wide, remove this sheet of paper for the present. On the elevation that is 20' wide the

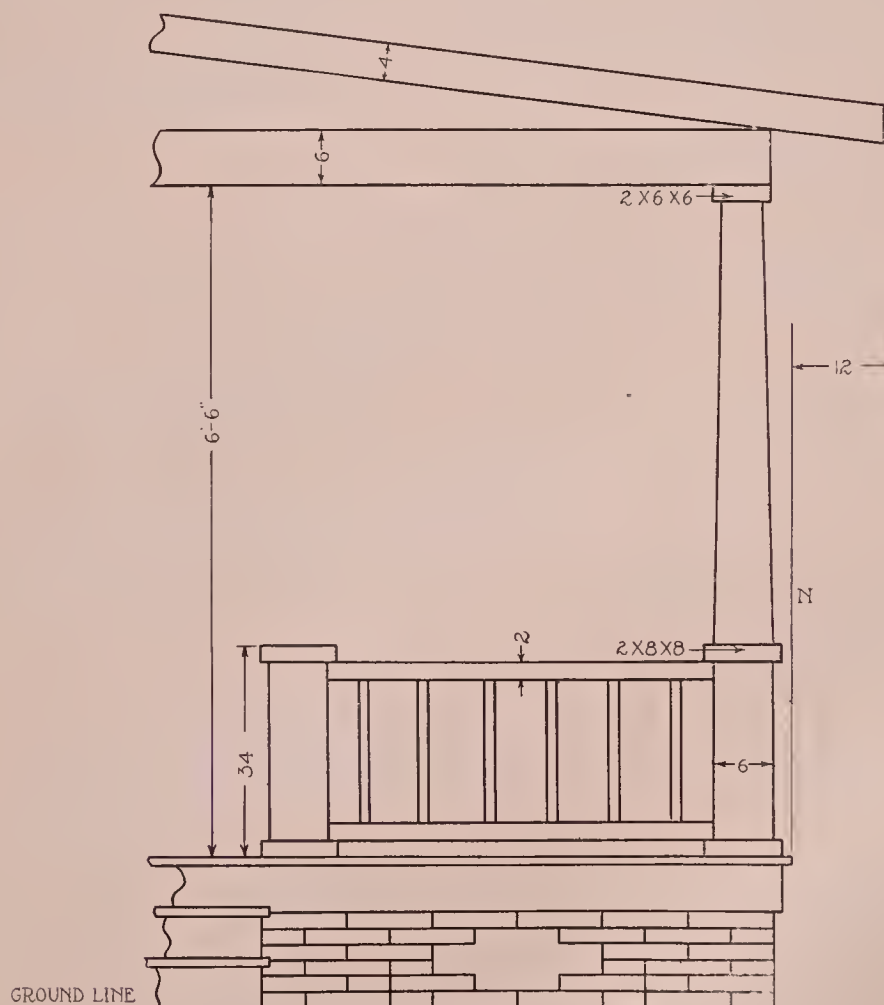


FIG. 15.

of the lower ridge. Draw a long vertical line 12" outside of the third corner line. Make a vertical chimney line near the

porch should be drawn as shown in Fig. 15. The line N is the third corner line of the house. The floor of the porch is

the upper tread of the steps. Draw the vertical step line as in Fig. 3. The bricks of the porch foundation are on a level with those of the foundation of the house. Make the pitch of the porch $1/16$, and draw lightly, the pitch diagram above the porch. Extend the slanting lines that represent the fascia board until they join with the lines for the fascia board on the steeper roof. The two horizontal lines of the porch frieze board should be extended until they join the outer line of the middle corner board.

The porch should be drawn on the other elevation before intensifying it. All lines not intensified should be cleaned off, and the title "Front Elevation," "Back Elevation," or "Side Elevation" should be lettered on each sheet.

STAIR DRAFTING.

PROBLEM III. To draw the plan and elevation of stairs. The clear story in the first floor of the house is to be $8' 9''$ and the thickness of the second floor is to be

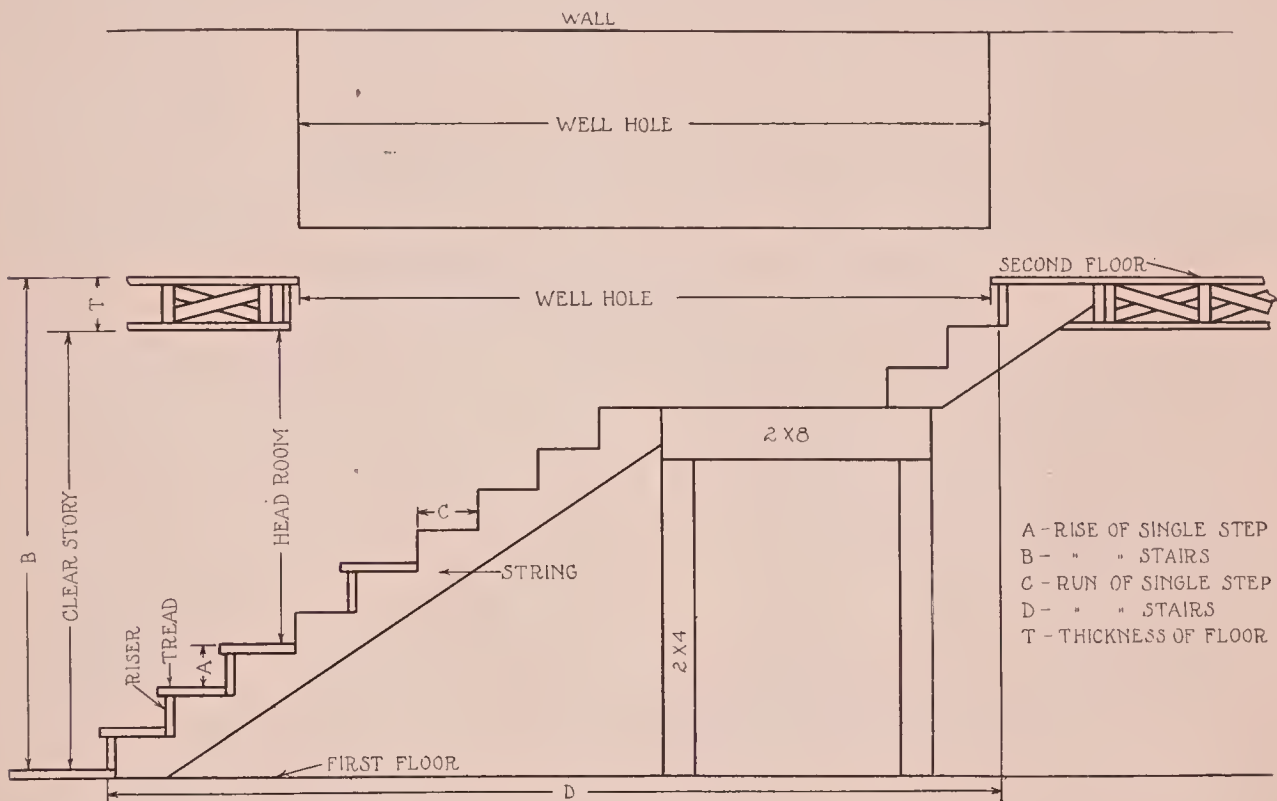


FIG. 16.

If this is not the sheet with the detail on, it is ready for intensifying and this should be done in the following order: chimney, steps, porch, doors and windows, fascia, frieze and corner boards, shingles and foundation.

If this is the elevation with the detail on it, the horizontal line for the ridge of the higher gable, the two vertical lines $12''$ outside of the two outer corner lines and the chimney should be drawn before intensifying.

$9\frac{1}{2}''$. The rise of each step is to be between $7''$ and $9''$. The run of one step is to be extended to form a $4'$ landing and the run of all others is to be $10''$. The landing is to be at such a height that it will allow for a clear story of at least $6' 6''$ below it, with the floor of the landing $9\frac{1}{2}''$ thick. The head room on the stairs is to be $6' 3''$. The length of each tread is to be $3' 3''$. Fig. 16 illustrates the framing of such stairs and also makes clear many of the terms used. The rise of a

single step is the actual distance a person is raised when stepping from one step to the next one above. The riser is the vertical board that is nailed against the vertical part of the string. The rise of the stairs is the sum of the rises of all the steps. The run of a single step is the horizontal distance from the face of one riser

steps. This will give you the maximum and minimum number of steps allowed by this problem. Select some number between these two as the number of steps you will use, and divide the rise of the stairs by this number to determine the rise of each step. Sketch the first step lightly, beginning near the left end



FIG. 17.

to the face of the next riser. The board on which a person steps is called the tread. The run of the stairs is the sum of the runs of all the steps except the top one which is in reality the second floor.

A. Sketch, as in Fig. 17, the plan and elevation of the stairs on half-inch squared paper to a scale of $\frac{1}{2}''=1'$. Figure the total rise of the stairs and sketch lightly the two floor lines, the lowest one being very near the bottom of the sheet. Figure the rise of each step. This may be done by dividing the total rise by the greatest (9") and least (7") possible rise of single

of your sheet of paper. Figure the height of the second step from the first floor line, and sketch the second step. Figure the height of the third step *from the first floor line*, and sketch third step. Continue in this manner until all steps are shown in the elevation, but before getting too high, determine which step is to be extended to form the landing. Next determine the length of the well hole to provide the necessary head room, and sketch it on the elevation. Sketch a 2' 3"x6' door entering under the landing, a newel post 5" square and 3' high on the first tread, also

two such posts on the landing and three on the second floor. The left side of the right-hand post on the landing should be 10" from the riser to the right of it. Draw a hand rail 2"x3" meeting the lower newel post 2' 9" above the tread and running parallel to the angles of the steps. Two 1" square spindles should be shown extending from each step to the hand rail and a portion of the railing on the second floor should also be shown. The plan should now be sketched directly above the elevation. Start by sketching a line near the top of the paper to represent the farther vertical wall. The width of the well hole should be 3' 6". The plan of the steps, landing and railing should now be drawn. Parts not showing thru the well hole should be shown by invisible lines. Intensify sketch, and have it approved.

B. *Make a mechanical drawing from the sketch*, using the scale of $\frac{1}{2}"=1'$. It is convenient when making this drawing to use a vertical step line, a vertical door line and a horizontal step line as shown in Fig. 17. On the step line locate the mark even with the top of the first floor and the one even with the top of the second floor and by using dividers, divide the distance between these two marks into the correct number of parts.

A TWO-STORY HOUSE.

PROBLEM IV. To draw plans and elevations of a two-story house.

A. *Sketch at least two sets of plans* on $\frac{1}{4}"$ squared paper, to a scale of $\frac{1}{4}"=1'$, for the first and second story, giving particular attention to the location of chimneys on both plans, and to the study of the stair problem. The important things to be determined about the stairs are the exact location of the first step on the lower floor plan, the exact location of the top step on the upper floor plan and whether proper head room is provided both on the stairs and in rooms and passage ways under the stairs. Remember that a landing is simply an extended tread, and that the steps above it may continue in the same direction as in Problem III, or they may continue from the landing at right angles to, or even in the reverse direction to that taken by the steps below the landing.

No limits are given for your plans, but simplicity is advised. Stock sizes of doors, windows, etc., may be secured from the instructor.

B. *Make mechanical drawing from these sketches*, using a scale of $\frac{1}{4}"=1'$. This will be supplied by the instructor.

C. *Make front elevation and follow with the others.*

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